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Hawkins et al.

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(54) **SOURCE-ASSISTED ATTENUATION
CORRECTION FOR EMISSION COMPUTED
TOMOGRAPHY**

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patent is extended or adjusted under 35
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This patent is subject to a terminal dis-
claimer.

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(58) Field of Search 382/131, 128,
382/129; 250/363.04; 378/4; 364/414

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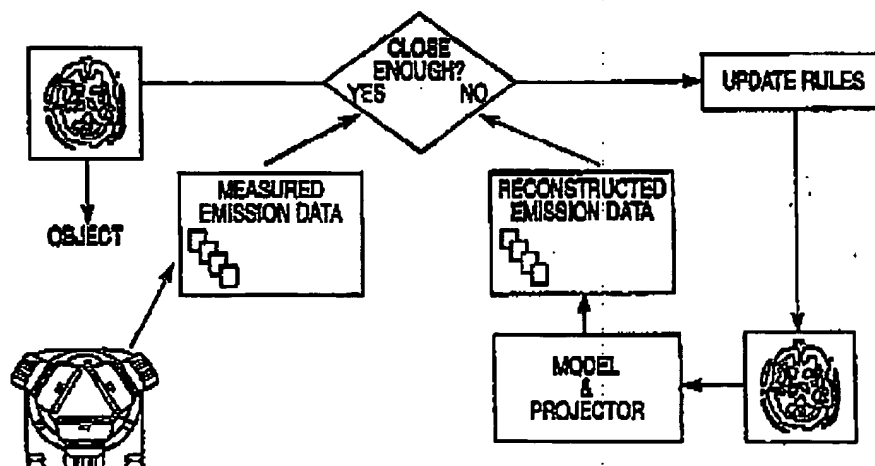
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(57) **ABSTRACT**

A method of ML-EM image reconstruction is provided for
use in connection with a diagnostic imaging apparatus (10)
that generates projection data. The method includes collect-
ing projection data, including measured emission projection
data. An initial emission map and attenuation map are
assumed. The emission map and the attenuation map are
iteratively updated. With each iteration, the emission map is
recalculated by taking a previous emission map and adjust-
ing it based upon: (i) the measured emission projection data;
(ii) a reprojection of the previous emission map which is
carried out with a multi-dimensional projection model; and,
(iii) a reprojection of the attenuation map. As well, with each
iteration, the attenuation map is recalculated by taking a
previous attenuation map and adjusting it based upon: (i) the
measured emission projection data; and, (ii) a reprojection of
the previous emission map which is carried out with the
multi-dimensional projection model. In a preferred
embodiment, with source-assisted reconstruction, the recal-
culation of the attenuation map is additionally based upon:
(iii) measured transmission projection data; and, (iv) a
reference or blank data set of measured transmission pro-
jection data taken without the subject present to the imaging
apparatus (10).

27 Claims, 8 Drawing Sheets



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